wildlife management in british columbia

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Wildlife Management in British Columbia

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What is Wildlife Management?

Everyone understands the word "wildlife". But add the word "management" and many people are bewildered. Why would a back-woods moose or a back-yard robin need to be managed? Can't we just let nature take its course? In a wilderness setting sometimes we can, but there is little true wilderness left, even in a province as large as British Columbia. There are few places where we humans have not intruded in some way, changing the environment and using natural resources to suit our own purposes.

Wildlife — like our forests, waters, and soils — is a natural resource. It is a resource made up of many kinds of living creatures, used directly by many people, and influenced indirectly by the numerous ways people tamper with the other basic natural resources.

Wildlife management employs our understanding of how animals, their environment, and people interact, and operates through programs such as wildlife protection, habitat improvement, and harvest regulation, to secure the present and future welfare of the resource.

This booklet explains some principles which underlie wildlife management, and outlines how wildlife resources are managed in British Columbia.

Good management is an inescapable obligation if we are to ensure that we will always have wildlife to share the land with us.

A Wealth of Wildlife

British Columbia has more diversity in its landscape than any other province in Canada. Its large size, coastal location, and mountain ranges present a great variety of terrain and generate contrasting climates. There are rain forests on the outer coast, near-deserts in the south Okanagan, balmy southern valleys, and frigid alpine heights. In consequence there is also a great diversity of plant life. Within the province there are grasslands, shrublands, alpine tundra, arid areas and swamps, lakeland and river bottoms, as well as many kinds of forests: British Columbia has five out of the eight major forest types found across Canada. The deeply indented and varied coastline with many islands and estuaries, together with interior lakes, marshes, and floodplains, add further to this diversity.

In this geographic and climatic mix there are many different sorts of habitats, or places for wildlife to live, and many kinds of animals are able to live in B.C. — considerably more species of birds and mammals than in any other province. Seventy-one percent of all the kinds of bird that nest in Canada, and 74% of the mammal species that live in Canada, are found in British Columbia.

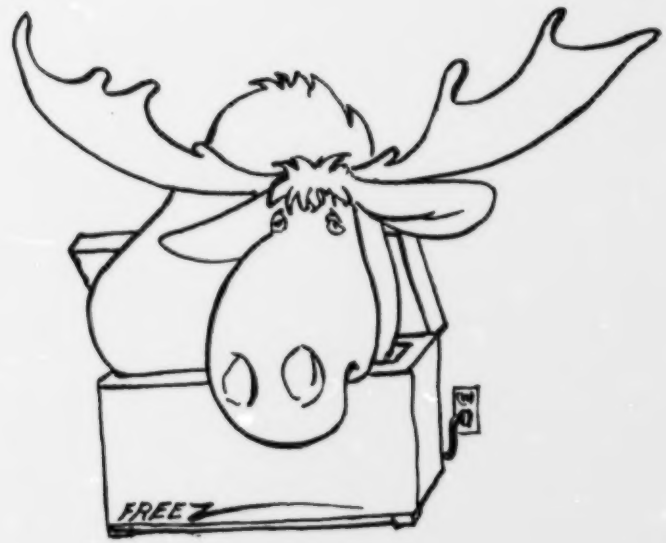
B.C. has more species of wildlife than any other province in Canada.

Everyone's Resource

Many people benefit from B.C.'s diverse wildlife heritage. Wildlife provides food for rural people, income for trappers, recreational hunting for city and country dwellers alike, opportunity for scientific research, study for naturalists, and aesthetic pleasure for everyone.

Food

Big game animals have been an important source of food in the province since before the time of European settlement. Even today, many northern and rural people with limited income opportunities depend heavily on wild game for food. The urban hunter may also keep his family food bill down with a moose in the freezer. Each year about 2,600 metric tonnes of moose meat, a highly nutritious, fat-free source of protein, are harvested in B.C. An equivalent amount of beef would cost 5 to 10 million dollars! Vast areas of B.C. that are not suitable for farming produce large amounts of wild meat without the expense of land clearing, fencing, or hay production.



Hunting

About 150,000 B.C. residents go hunting most years, for meat and for sport. They spend close to $100 million on licenses, transportation, equipment, and other items. In a typical year, hunting provides nearly two million hunter-days of healthy outdoor recreation. Many suppliers of goods and services benefit from this activity.

Non-residents are attracted to B.C. to hunt because of the presence of game animals that are no longer common elsewhere. About 4,000 non-resident hunters spend about $16 million a year in B.C., over $7 million of the total going to guides and outfitters. This spending occurs in northern and rural areas where other sources of income are limited or non-existent. In many small, isolated communities guided hunting provides employment for outfitters and their employees, as well as income for the suppliers of groceries and other goods, and services such as aircraft charters. This source of revenue can continue year after year, because hunting, unlike mining or logging, depends on a resource that renews itself annually.

Trapping

Trapping of fur-bearing animals was probably the first economic activity in B.C., and it still continues today. In recent years pelts worth $3-4 million in raw condition are being taken annually. Because the only major outlay is the trappers' time, most of this revenue goes directly to the trappers themselves, many of whom live in remote areas with little other opportunity for income.

Just Looking

British Columbians place a high value on just being able to see wildlife in a natural setting. The importance of this "non-consumptive use" is obvious in the increasing popularity of guided nature tours, the thousands of visitors to our parks, and the intense interest shown in wildlife centers like Reifel Refuge and Creston Valley. Many amateur naturalists, bird books and binoculars in hand, pursue wildlife near their homes and far afield. It has been estimated that B.C. residents spend over $400 million per year on outings specifically to see fish and wildlife each year. A survey showed that in 1983 over 1.5 million B.C. residents devoted about 120 million days to non-consumptive enjoyment of wildlife.

While few visitors other than hunters or dedicated naturalists may come to B.C. just to see the wildlife, the abundance and diversity of birds and mammals is an integral part of British Columbia's attraction as an unspoiled wilderness, an image that brings many tourists. The knowledge that grizzly bears and peregrine falcons still occur here is important to many people, even if they never see them. A sizeable portion of the several hundred million dollars spent by tourists in B.C. each year could easily be attributed to the wildlife resource.

The dollar value of wildlife for food, hunting, trapping and non-consumptive use is over $500 million per year in B.C. This is over and above aesthetic and other long term values.

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A Changing Environment

Since earliest times, man has had an effect on British Columbia's wildlife. In the pre-settlement era the native people hunted animals for food, for hides used to clothe and shelter themselves, and as the raw material for animal products like bone or antler tools, decorations or cultural artifacts. The total native Indian population of B.C. was relatively small, and had limited means to endanger wildlife populations through over-hunting. Today the activities of more numerous, better-equipped hunters are highly regulated, and it is not by hunting, but by modifying the habitats which all species need for survival, that man most dramatically affects most species of wildlife.

The major kinds of land use which can have adverse effects on wildlife include agriculture, logging, hydroelectric projects, oil and gas exploration, mining, highways and roads, utility corridors, and human settlements. When these activities damage or destroy habitat, there is often a permanent reduction in the number of animals the affected area can support. Wildlife populations that have been reduced by hunting or trapping can usually be restored by protection or re-introduction of breeding stock. If the habitat is destroyed, the wildlife cannot be restored.

Activities that destroy habitat are the greatest threat to wildlife.

Agriculture

Grazing by domestic animals began very early, with the pasturing of horses around fur trading posts in the southern Interior. The horses competed for range vegetation normally used by deer, elk and bighorn sheep. Later the development of ranching brought cattle and domestic sheep onto the ranges in large numbers, adding further competition for native grazing and browsing animals. Predators like wolves, coyotes, and bears were unpopular with settlers, who sought to eliminate them to protect their livestock. The earliest settlers, mostly miners and farmers, cleared much land by setting forest fires, a practice that benefited some kinds of wildlife and harmed others. Expansion of farming resulted in complete loss of habitat for some wildlife species through clean cultivation of the land.

These direct influences of agriculture continue today, accompanied by more subtle and complex effects that are just becoming apparent. Periodic die-offs of Rocky Mountain bighorn sheep, for example, have been linked with the presence of domestic sheep on the bighorn's winter ranges. Stress from competition for food and space, compounded by diseases and parasites, appear to have contributed to heavy losses among the wild sheep.

Logging

In British Columbia logging has a greater effect on wildlife than any other land use. About 55% of the land in B.C. supports productive forests. The same productive forests also support much of our wildlife. Logging has spread widely in the past 40 years, and drastically altered large areas of wildlife habitat. Species that require mature or old-growth forest for food, cover, or nesting sites have been adversely affected, while animals that thrive in the new growth following logging have benefited. Virtually all forest-dwelling wildlife is affected in one way or another.

Reservoirs and Transmission Lines

Development of electrical energy has resulted in the flooding of about 8,000 km2 of valley land for hydroelectric reservoirs, and in the clearing of thousands of hectares of right-of-way for transmission lines. Valley land has the best soils and the most favorable climate, and thus provides the best habitat for many kinds of wildlife. Once flooded, the valleys and the wildlife they supported are lost forever.

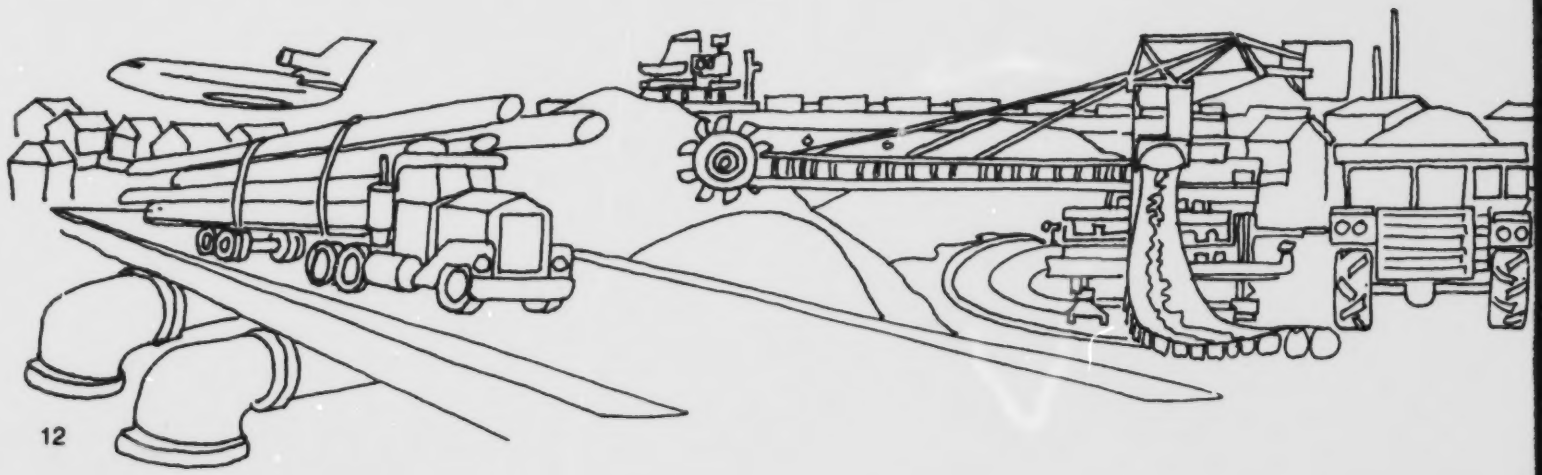
Mines

Extensive surface coal mines in northeast and southeast B.C. are making inroads into valuable wildlife habitats. Similar problems may occur in northwestern B.C. Although reclamation is required by law, it is often difficult to accomplish, and restored habitats do not always support the same kind or abundance of wildlife as the undisturbed area did.

Oil and Gas Exploration

Hundreds of miles of oil and gas exploration "cutlines" through the forest have affected wildlife habitats in the Peace and Liard River areas of northeastern B.C. Pipeline right-of-ways in that area, and elsewhere in the province, are having a similar impact. These linear corridors have both good and bad effects on wildlife habitat.

Many human activities transform the natural environment; sometimes helping wildlife, sometimes damaging the wildlife resource.



Access Roads

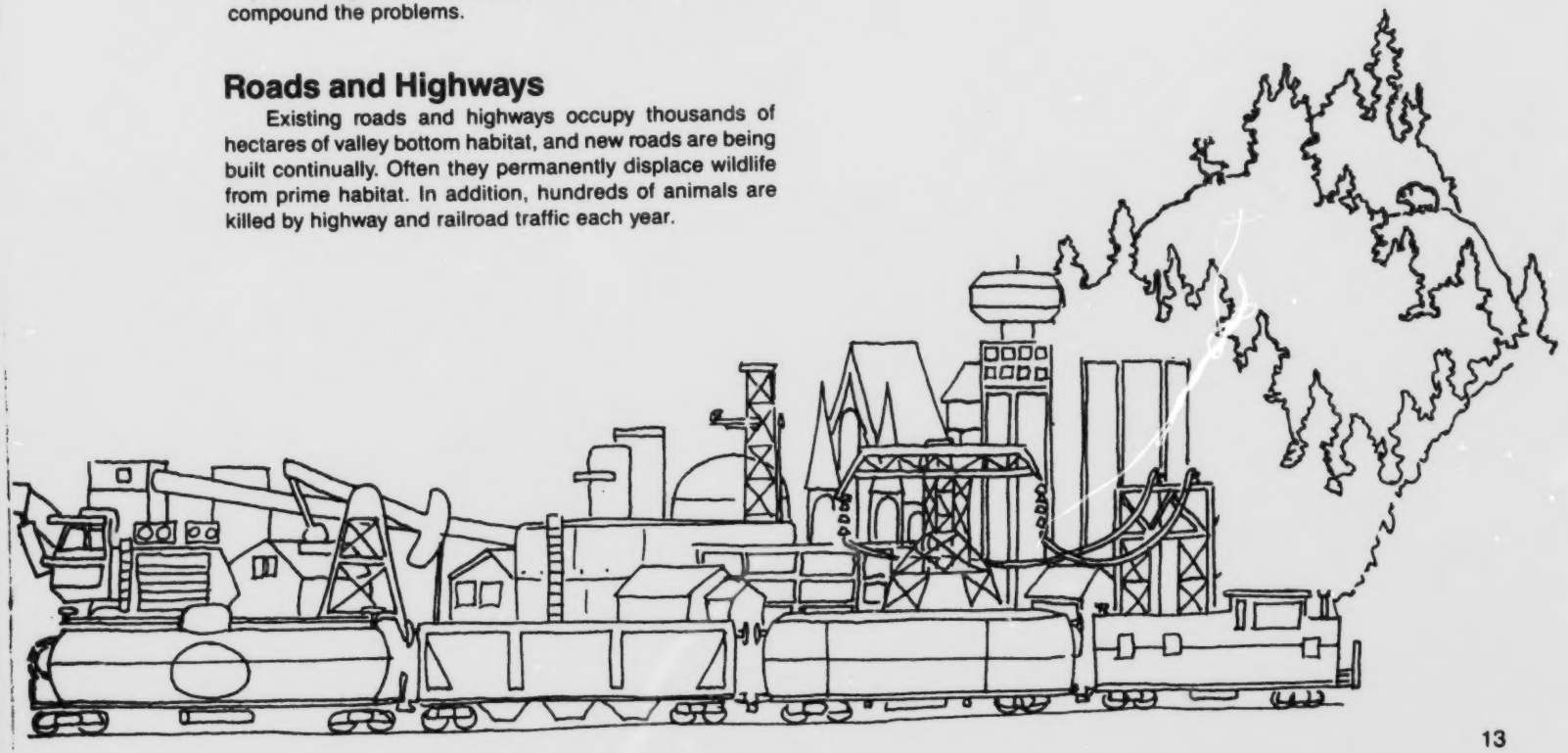
Logging has resulted in a myriad of access roads. This has opened great tracts of land to outdoor recreation, and allowed a significant increase in the legal harvest of game animals. At the same time, increased access has endangered some local game herds by exposing them to poaching, and has put undue stress on species that are sensitive to disturbance. Modern off-road vehicles, capable of penetrating and disrupting the most remote wilderness, compound the problems.

Roads and Highways

Existing roads and highways occupy thousands of hectares of valley bottom habitat, and new roads are being built continually. Often they permanently displace wildlife from prime habitat. In addition, hundreds of animals are killed by highway and railroad traffic each year.

People

The nearly three million people living in B.C. occupy a lot of space formerly used by wildlife. People also prefer the best habitats, like the valley bottoms of the southern half of the province. Towns, which require facilities such as water reservoirs, garbage dumps and sewage disposal sites, extend their influence on wildlife habitat far beyond the area actually occupied by homes and buildings.



No species of wildlife in B.C. has been eliminated by modern sport hunting, trapping, or predator control, and none are endangered by today's regulated harvest programs.

An Endangered Resource?

Writers and photographers have known for a long time that the plight of wildlife struggling for survival makes a dramatic and popular story. TV and magazines bring the problems of endangered species — sometimes with calculated shock effect — into the homes of most British Columbians. While this exposure has aroused much-needed public support to save animals that are threatened with extinction or abuse, there has been a tendency to overstate the case. Some journalists and well-meaning preservationists have distorted the status of Canadian wildlife, misunderstood the reasons that some species are declining, and misrepresented the measures needed to conserve diminished or genuinely endangered species. Because of this kind of misinformation, many people get the impression that most B.C. wildlife is endangered. That is far from the truth.

Despite some excessive killing of wildlife during the fur trade and settlement era, and damaging changes in habitat caused by man since, much of our rich wildlife heritage is intact today. Enforcement of protective laws and greatly improved public respect for wildlife have stemmed the tide of exploitation. Some species have recovered from previous overkill, and some are more abundant than ever before.

A few species have suffered in the past. Early hunting may have contributed to extinction of caribou on the Queen Charlotte Islands and the sage hen in the southern Interior, but it is more probable that habitat changes were the deciding factors. Within B.C. direct killing is known to have eliminated only one species: the sea otter. The sea otter has been re-introduced and is thriving once again, although the population is still so small that it is one of four species in B.C. officially designated as "endangered". The other three are the Vancouver Island marmot, the burrowing owl, and the white pelican. Their low numbers are due primarily to their specialized habitat requirements.

The mistaken belief that numerous wild animals are in a perilous state has caused many well-meaning people to demand an end to hunting, and to promote the formation of ever more sanctuaries and reserves. While control of hunting and the provision of reserves are important aspects of wildlife management, the "leave them be" philosophy is not adequate in itself to preserve wildlife. There are many examples demonstrating that non-use and "letting nature take its course" results in neglect and lack of protection. On the other hand, when people use a resource, they tend to value it, and to protect it so that its values will continue to flow.

Wildlife won't thrive if left to its own devices in a landscape where man tampers with many of the elements essential to its survival.

Management is Control

British Columbia has an abundance and variety of wildlife, and the resource is important to many people. But wildlife and habitat are being drastically affected by many land uses. Other land uses are important, and in fact have brought us the high standard of living we enjoy today. What can be done to reconcile the two? Can we have both wildlife and economic development?

Basically, what we have to do is manage the wildlife resource, its habitat, and the people who use wildlife, and equally important, we must try to modify the actions of those who would alienate or destroy wildlife habitat.

Management implies that we exert control. The traditional view of wildlife management has been a rather narrow one, that of direct control of wild mammal and bird populations, either through hunting, or by control of predation, starvation, or disease. In B.C. today, wildlife management consists of much more than that. Management includes modification of land uses in the interests of wildlife, and involves showing people how their activities can be changed to accommodate the wildlife resource.

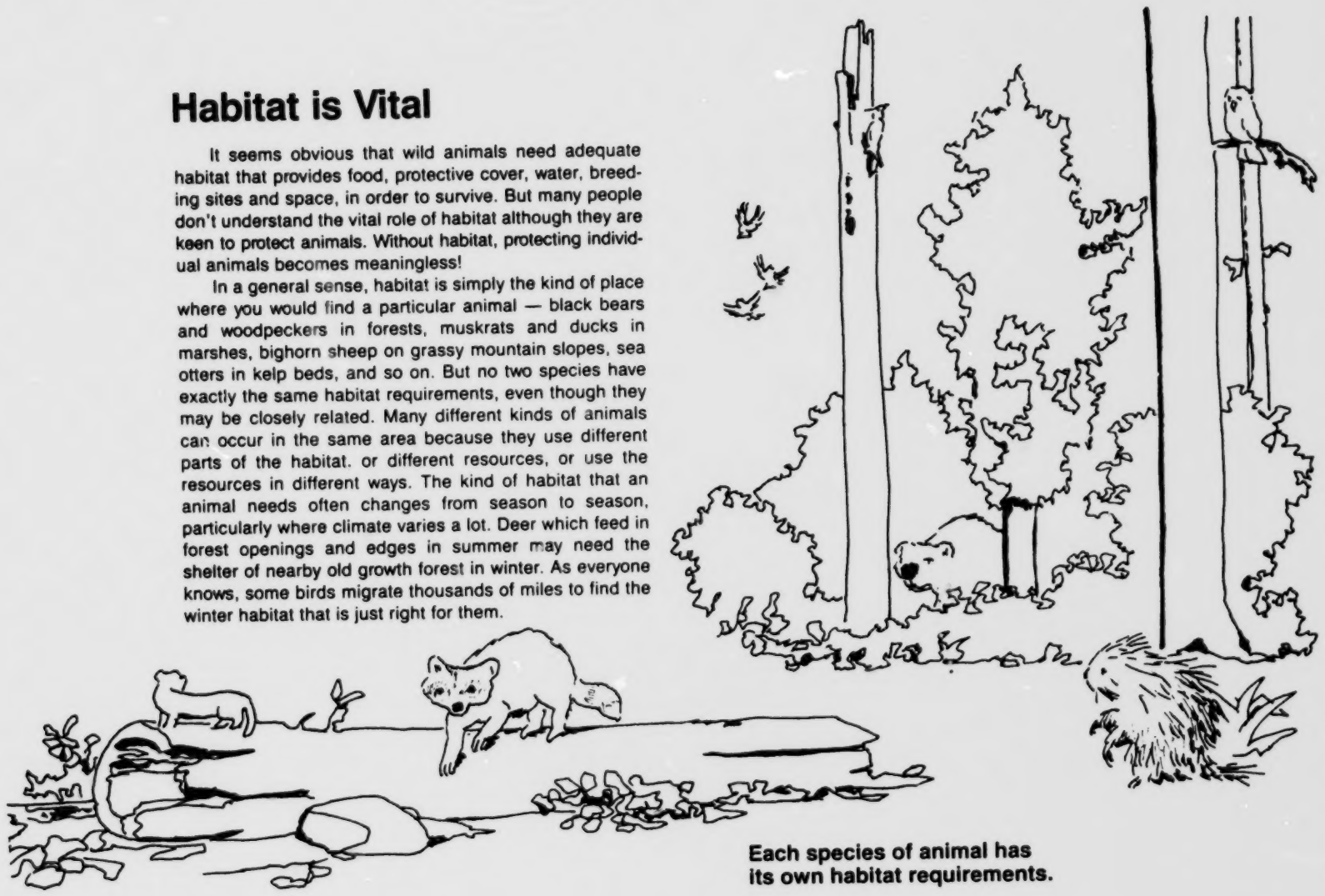
Management of animals, land use, and the behaviour of people are all necessary to ensure that the wildlife resource is sustained for the benefit of all.

Wildlife is managed in British Columbia to benefit all segments of society: people who want to know that all wildlife species are protected for the future, people who wish to see various animals in a natural setting, people who make economic use of wildlife as food, or by trapping or game guiding, and people who enjoy the challenge of recreational hunting. With the provision of a variety of wildlife areas — large wilderness zones, sanctuaries, parks, managed forests, designated wildlife areas, and open hunting areas — and with the provision of good management, all wildlife users will continue to benefit.

Habitat is Vital

It seems obvious that wild animals need adequate habitat that provides food, protective cover, water, breeding sites and space, in order to survive. But many people don't understand the vital role of habitat although they are keen to protect animals. Without habitat, protecting individual animals becomes meaningless!

In a general sense, habitat is simply the kind of place where you would find a particular animal — black bears and woodpeckers in forests, muskrats and ducks in marshes, bighorn sheep on grassy mountain slopes, sea otters in kelp beds, and so on. But no two species have exactly the same habitat requirements, even though they may be closely related. Many different kinds of animals can occur in the same area because they use different parts of the habitat. or different resources, or use the resources in different ways. The kind of habitat that an animal needs often changes from season to season, particularly where climate varies a lot. Deer which feed in forest openings and edges in summer may need the shelter of nearby old growth forest in winter. As everyone knows, some birds migrate thousands of miles to find the winter habitat that is just right for them.



Each species of animal has its own habitat requirements.

Food, Cover and Water

All animals need food to meet their energy needs: to grow, reproduce, escape predators, and survive chilling winters or long migrations. Each species selects very particular foods from many items that are present in its environment — just any kind of food will not do. For a bighorn sheep to survive, for example, there must be enough grass to last the winter, and the grass must also have sufficient nutritional value. The quality of food, as well as the amount present, is important for survival. Food quality may vary with the season, or even the location. Food must also be accessible to the animals. In winter, deep, crusted snows may cut off much of the food supply. An important objective for wildlife management is to conserve important feeding areas, and to increase the amount and quality of food available for wildlife.

Winter food shortage is the most important limiting factor for many wildlife species in B.C.

Birds and mammals need cover to hide in, and to protect them from bad weather. Dense vegetation is the most common kind of cover, but cover may also include rock piles, burrows in the ground, or holes in logs. Some small animals, like beaver and muskrats, build their own cover in the form of houses. Plant cover is removed by many modern land uses like logging, cattle grazing, and open pit mining.

Water is needed by all animals. Many of our wildlife species get enough water from the food they eat, such as succulent plants, but some need to drink free water, particularly in dry regions like the Okanagan Valley. Fortunately water is well distributed in B.C., and usually not in short supply.

Territoriality prevents over-crowding.

Space and Special Places

Many wildlife species have very particular needs for breeding sites. Dense cover is needed by cow elk to conceal their newborn calves, and by birds to hide their nests. Bald eagles need large old trees to support their bulky nests, and these trees must be near the shorelines where they feed. Hole-nesting birds need snags and old trees in which to excavate nests; falcons need cliff ledges, and seabirds that nest in colonies need secluded islands. Some mammals like wolves and bears need particular soil conditions for their maternity dens. Wildlife managers try to protect breeding sites, and to improve them where possible.

Animals need space to survive. Overcrowding leads to severe competition for food and breeding sites, and eventually to malnutrition and rapid spread of disease and parasites. Most animals are territorial to some extent; that is, they will defend a certain area against intruders. Their territoriality tends to ensure spacing and prevent over-crowding. Because of the need for space, a given area will only support so many animals, no matter how much protection they receive.

Wildlife managers try to ensure that animal populations have enough space and do not suffer dieoffs or damage their habitat through overcrowding.

The Right Mix

The arrangement of food, cover, water, and breeding sites determines wildlife numbers and their distribution. Most species need more than one kind of habitat, and the best arrangement is where many patches of the various habitat types occur fairly close together. Extensive tracts of a single kind of habitat don't support as much wildlife. When there is a good interspersion of different habitats, many individuals will have ready access to all of their needs, and the area will support a larger population. Edges between habitat types may be important habitats in themselves, and are used by many species. The tendency for a greater diversity of animals at edges between habitat types is called the edge effect.

Wildlife managers try to retain and create habitat diversity.

Limits to Abundance

No matter how good a habitat is, and no matter how much protection is given to the animals in it, a given area will support only so many animals.

The number of animals that an area will support without damage to the habitat or to the animals is called the carrying capacity.

Birds and mammals can increase in numbers very quickly, and may sometimes exceed the carrying capacity of their habitat. This results in social stress, competition for food, starvation, greater exposure to disease and parasites, poor reproductive success, and damage to the habitat. For example, multiplying muskrats can very quickly eat all the vegetation in a marsh, and then die out. When the habitat is damaged, the carrying capacity of the area is reduced. A good trapper will watch the effects that muskrats are having on marsh vegetation and harvest the excess population before it damages the habitat.

In B.C., the carrying capacity of many wildlife habitats is determined by winter weather. There may be an excess of available food, cover, and space in summer, but not enough in winter. This is particularly true for species that eat plants, because the vegetation dies back in winter, may be covered by snow, and is less nutritious.

Many animals defend a territory in order to ensure that they have enough food, cover, and breeding sites to raise their young. The territory size determines the carrying capacity of the habitat; territories set a limit on how many animals can be supported by the area. If the habitat is good, territories will often be smaller, and more animals can live there.

The best way to increase wildlife numbers is to improve the carrying capacity of habitats.

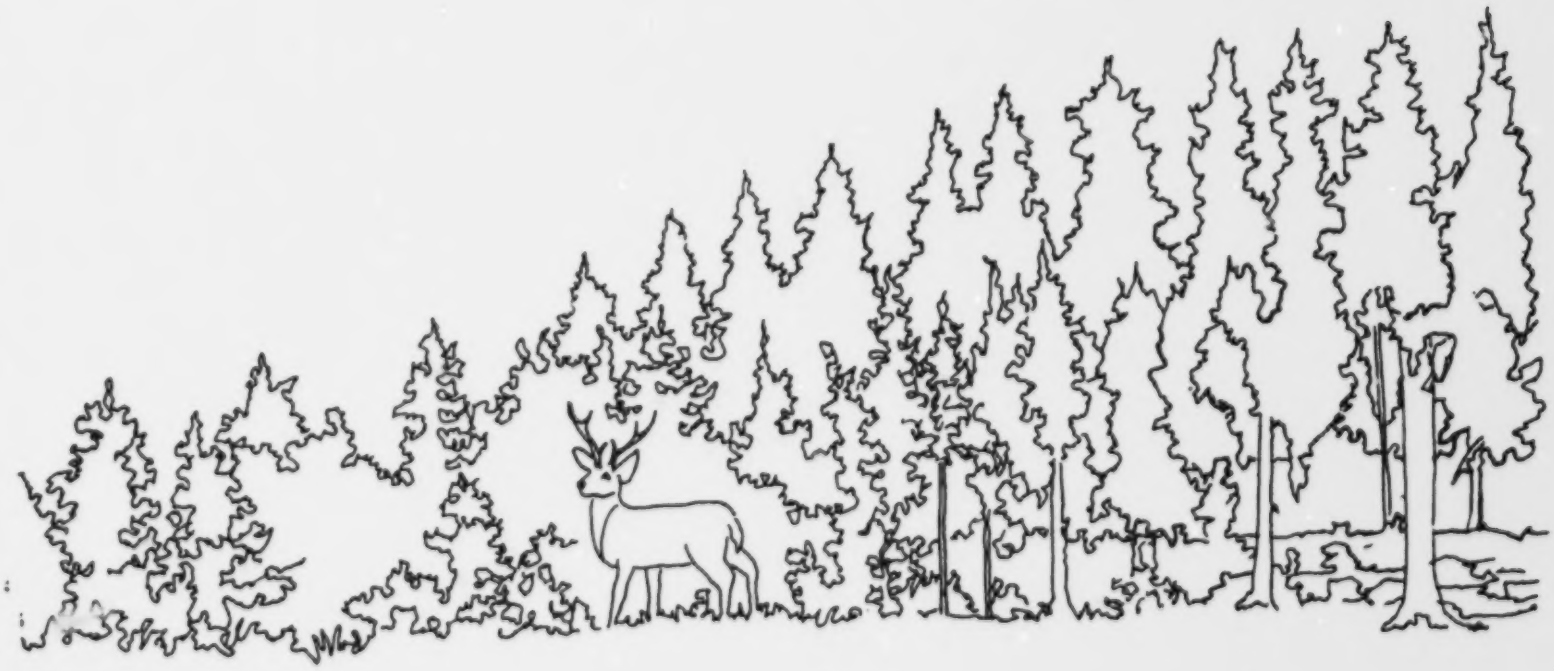
The Habitat Keeps Changing

Habitats are always dynamic, never static. Even natural habitats untouched by man are continually changing, altering their carrying capacity for individual species in the diversity of wildlife they contain. Most of the natural changes (in a process known as succession) result from the interaction between the soil, plants and animals in the area.

An example of long term succession is the gradual change of a lake, first to a marsh, then a meadow, and finally a forest. The process may take thousands of years, as the lake gradually fills with sediment and one kind of growth replaces another. Shorter term successional changes are more apparent to people, because dramatic differences can be seen in a lifetime or less. Accelerated succession usually follows some sort of disturbance such as a forest fire, logging, or land cultivation. For example, after a fire in a Douglas fir forest, a rich growth of grasses and other herbs becomes established. This is gradually replaced by shrubs and seedling trees, often fast growing species such as alder. These are eventually replaced by a dense growth of regenerating fir which grows into a mature forest. Succession can take decades, or even centuries, depending on the tree species involved and site characteristics such as soil, elevation, and climate. Each stage in the succession has a characteristic complement of wildlife species which change as the habitat changes.

Many important species of B.C. wildlife are most abundant in the early stages of forest succession — blue grouse and black-tailed deer on the coast; moose and snowshoe hares in the interior. Other species like the spotted owl require mature forest, and may even need old-growth, that is, tree stands that are 300 or more years old!

Natural habitats change through the process of succession. Each stage has a characteristic complement of wildlife species.



Population Dynamics

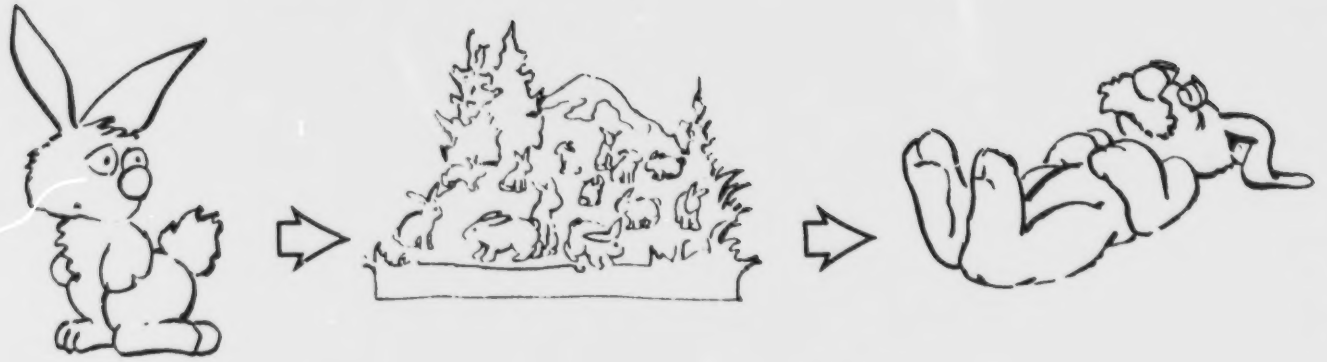
A population is the number of animals of one species living in a given area.

Over a period of time, the abundance of a species in any one place — that is, the population — will vary. This may be caused by successional changes, competing land uses that alter the carrying capacity, predation, the effects of extreme weather, or harvests by man. It is important to understand what underlies population changes so that safe harvest limits can be set, and so that the impacts of other land uses can be accounted for.

The processes which affect the ups and downs of wildlife populations are called population dynamics. Two processes of major importance are the birth rate and the death rate.

Most kinds of wildlife have a high birth rate, but this does vary. Small animals have higher rates than large ones; and herbivores generally have higher rates than carnivores. For example, a mule deer population can more than double every second year under favorable conditions. One doe can produce 15 or more fawns in a life span of 8 years. If all her young and their fawns survived to the same age and bred as successfully, they would number 150 or more before her death! This is obviously many more deer than are required to maintain the population. Many animals — songbirds, beaver, squirrels, grouse and ducks, for example — can increase at even greater rates. Female muskrats breed when they are one year old and may produce two or three litters of up to ten young in a single summer. On the other hand, grizzly bears have a low reproductive rate because females don't breed until they are about 4 to 8 years old, and then have only a couple of cubs every three years or so.

Wildlife populations change during a year, and from year to year.



Since most animals produce many offspring, and we don't see the population numbers constantly increasing, it follows that the death rate is also high. Those with the highest birth rates also have high death rates. The causes of death, such as starvation, disease, predation, accidents, weather, and hunting are called mortality factors. For example, weather can cause great variation in both the production and the survival of young. Any of the mortality factors may be important in particular places at particular times. Wildlife biologists take the different birth and death rates into account when managing wildlife populations.

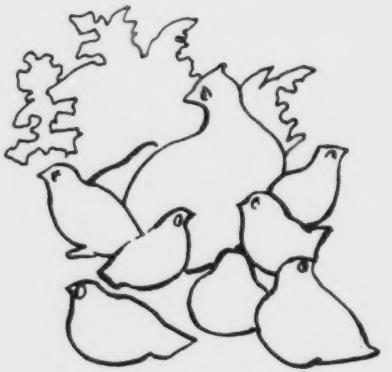
In B.C. as a whole, winter starvation is probably the most common cause of wildlife deaths.

Breeding Stock

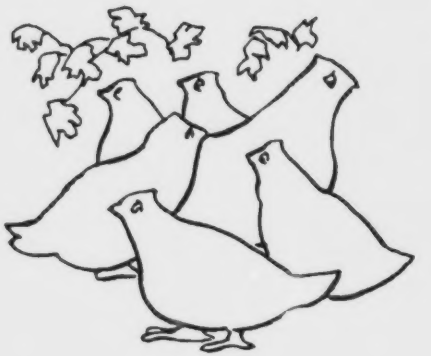
The number of animals in a wildlife population varies with the seasons.

The size of wildlife populations goes up and down with the seasons. Seasonal changes may be pronounced, particularly in animals that have high birth rates. Pheasants, for example, begin mating and having young in spring. The population reaches its peak in early summer, when it may be four or five times higher than in the spring. By late summer the population has begun to decline due to

EARLY SUMMER



LATE SUMMER



FALL

various mortality factors such as predation. During the rest of the year more birds are lost, because the habitat can't support all of them, particularly in winter. By late spring of the following year, the population size is again down to the level of the breeding stock, that is, the number of individuals needed for breeding to replenish the population.

Managers use their knowledge of the seasonal and long term changes in wildlife populations to regulate harvests for human use without harming the breeding stock.

WINTER

SPRING

Wildlife Management in British Columbia

protection	population management	habitat management
reserved lands	introductions	habitat improvements
protected species	predator control	co-ordinated resource management
harvest regulation	selective harvests	

Who is Responsible?

Under authority of a provincial statute called the Wildlife Act, wildlife management programs in B.C. are primarily the responsibility of the Wildlife Branch in the Ministry of Environment and Parks. The Ministry employs management and habitat protection biologists, technicians and conservation officers in the regional offices. In the provincial headquarters in Victoria it also employs staff specialists, service groups and senior administrators.

Although the Canadian constitution gives jurisdiction over wildlife resources to the provinces, there is some federal involvement in wildlife management. Birds which migrate from Canada to other countries, such as ducks and geese, are subject to provisions of the Migratory Birds Convention Act, a federal law administered by the Canadian Wildlife Service, which is part of Environment Canada. Migratory birds, therefore, are jointly managed by federal and provincial governments.

Within British Columbia the provincial Ministry of Forests and Lands is becoming increasingly involved in wildlife management because forestry activities affect vast areas of habitat. The Parks and Outdoor Recreation Division of the Ministry of Environment and Parks works in close collaboration with the Wildlife Branch to manage wildlife in Provincial Parks and Ecological Reserves, largely through protective measures and public education. Municipal and regional governments may play a role in wildlife management through their operation of local parks, sanctuaries and nature centers. Ducks Unlimited, a private foundation, is heavily involved in waterfowl habitat development in B.C., and sportsmen's and naturalist groups contribute both time and money for wildlife projects. Even individuals participate in wildlife management in B.C. Trappers and guides report on harvest of wildlife from exclusive territories, and hunters provide information about their bagged game. Many people are involved.

Cooperative projects between several groups are also becoming common. One example is the Buttertubs Marsh in Nanaimo, where privately owned marshland purchased by the B.C. Nature Trust, was developed by Ducks Unlimited, and is now managed by the B.C. Ministry of Environment and Parks, with advice from a local committee whose membership includes City Council, the Fish and Game Club, and the Naturalists Club.

There are many opportunities to become involved in wildlife management.

Protection Through Reserved Lands

B.C.'s 600 species of birds and mammals receive protection in a number of parks and reserves set aside for general conservation purposes, and also in places set aside specifically for wildlife. The list is impressive and growing — five National Parks, 363 Provincial Parks, Recreation Areas and Nature Conservancies, over 100 Ecological Reserves, and several Federal Bird Sanctuaries. In addition numerous parcels of provincial land, totaling nearly 900,000 hectares, have been designated for wildlife use. About 375,000 hectares of that total are under secure tenure to the Ministry of Environment. Trapping and hunting are allowed in parts of some large Provincial Parks and in some of the designated wildlife lands, but many of the protected lands are closed to wildlife harvest. A feature more important to the conservation of wildlife is the provision that habitat within some reserved areas cannot be altered by industrial or other use without consideration for wildlife.

Additional lands in and around the fringes of many towns are closed to hunting, mainly for human safety, but nevertheless providing effective year-round rest areas for many kinds of wildlife. Many regional and municipal parks, particularly on the Lower Mainland and Vancouver Island, provide safe refuges and protect wildlife habitat; functions also served by local sanctuaries operated by conservation groups.

Reserved lands represent one end of the spectrum of wildlife management, where species and their habitats are preserved to the benefit of hikers, campers, photographers, birdwatchers, and all students of nature. But despite the number of areas involved and their high priority for wildlife, reserved lands comprise only about 6½% of the area of B.C.

Most of our wildlife must be managed on land being used for other purposes.

Protection Through Harvest Regulation

In pioneer days B.C. settlers could shoot almost any wildlife, anywhere, any time. Gradually, restrictions on hunting have increased until today they are very stringent. Sportsmen themselves have promoted increased protection of the wildlife resource and have requested harsher penalties for those who disregard the game laws. Hunters who have not hunted before must now take a course of study, the CORE program, and pass an exam before they can obtain their license. The provincial hunting regulations now are about sixty pages long, and have to be studied diligently. A hunter wishing to hunt ducks in the lower Fraser Valley must obtain a provincial hunting license, federal migratory bird permit, a Fraser Valley Special Area hunting license, and $100,000 worth of public liability and property damage insurance! Hunting today requires planning and commitment. Today's sportsmen realize that hunting is a privilege, and they assume much responsibility for good wildlife management.

Protective measures work only because most people respect wildlife and the law.

Sport hunters help in law enforcement via the "Observe-Record-Report" program. However, illegal killing of wildlife is still a significant problem in some places where animals are poached by people who do not need wild meat for survival, and may even make a business of selling it. Although poaching is a problem, it won't be solved by placing more restrictions on legitimate hunters. The poacher by definition is a criminal who disregards regulations.

Hunting regulations are many and varied. For purposes of wildlife management the province is divided into over 200 Management Units. Each M.U. potentially has particular hunting regulations. An additional 250 "special areas" (closed, limited entry, and no shooting areas) are listed in the regulations, and this list increases each year.

Some regulations apply to the whole province, and others to individual M.U.'s. This allows hunting regulations to be specially tailored for local situations. There are regulations regarding season length, bag limits, age or sex of animals open to hunting, shooting hours, use of vehicles, spotting animals from the air, kind of firearms used, and so on.

Because the demand for some kinds of animals exceeds supply, a system of limited entry hunting has been initiated. Hunters must apply in advance and take a chance on being selected by a computer draw to receive a limited entry authorization. Sometimes only two or three of these are issued for a particular species in a particular valley or watershed. Limited entry is also used to control the number of animals of a particular age or sex that hunters may harvest.

Hunters participate in wildlife management by conscientiously complying with extensive and detailed hunting regulations.

Getting Information

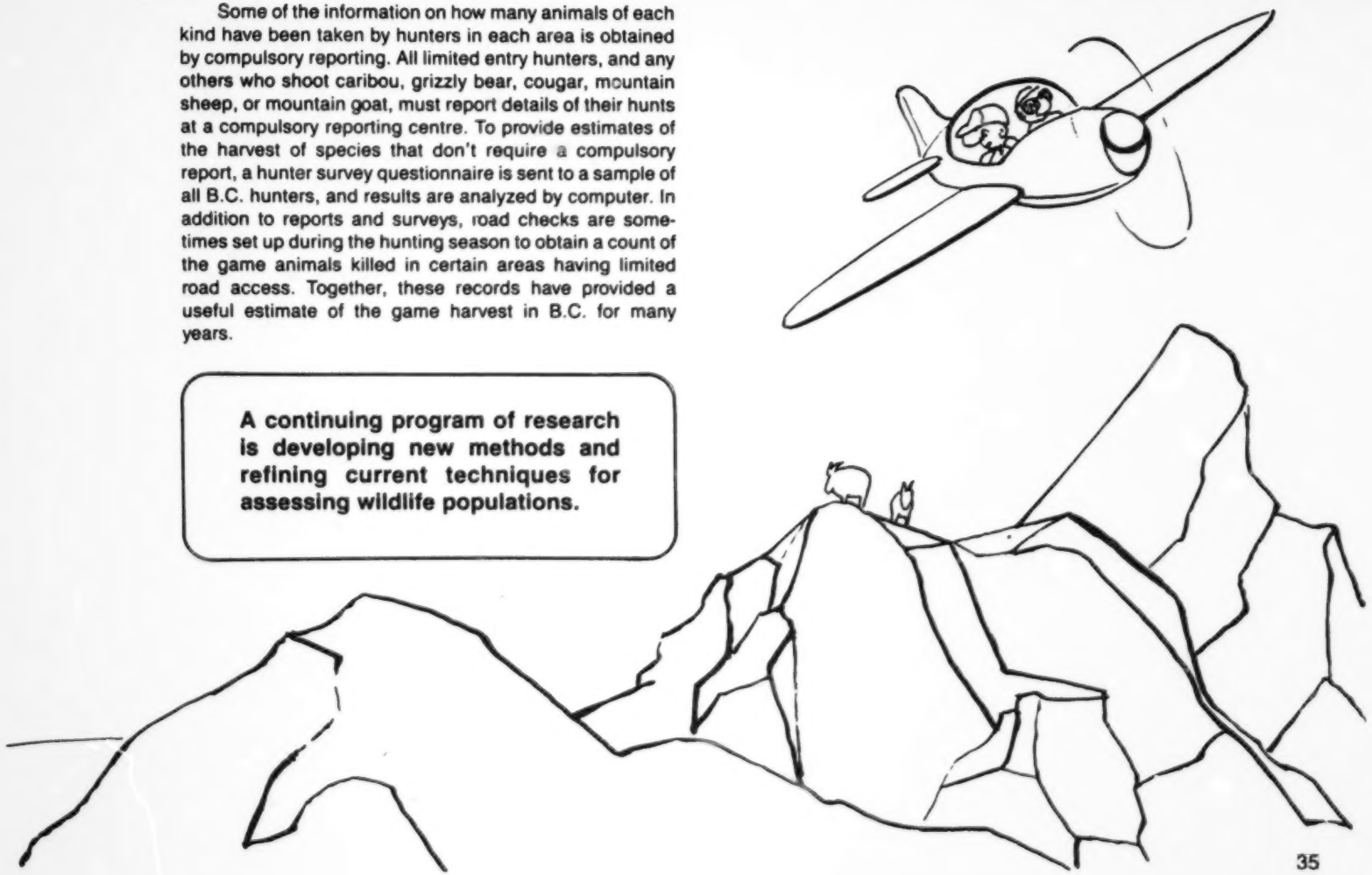
Wildlife managers in B.C. exert careful control over the level and nature of the game harvest. In order to apply this control successfully, they require a great deal of information about game populations. Most importantly they need an estimate of the number of animals in the hunted population, and the number taken each year. Estimating the number of animals present is called inventory. Biologists use aérial surveys for most big game animals, particularly in interior and northern B.C. The animals may be counted and classified on sample plots or entire winter ranges. When leaves have fallen from the poplar trees and snow is on the ground, dark animals like moose are fairly easy to spot.

Wildlife managers need to know game population trends and hunter harvests to apply control measures successfully.

Animals like coast black-tailed deer, black bears and blue grouse, which occur year round in fairly dense cover, are much harder to spot. A different approach must be used for them. Managers use clues such as trend surveys, hunter success, or the ages of harvested animals to provide an index of the status of a population. Spotlight counts and other surveys of the live animals are often more revealing of what is happening in the living population than harvest data. However, if the same number of hunters get progressively fewer deer from the same management unit each year, the population is probably declining. Of course such a decline could be due to hunting or to a number of other factors, such as forest succession, predation or habitat loss. Habitat analysis can sometimes confirm the cause. The age structure of a population, that is the number of animals in each age category, provides an indication of whether the population is productive or declining, and whether the animals are being overharvested. There are several ways of determining the age structure of a population; one of the easiest methods is to collect and analyze teeth from harvested big game.

Some of the information on how many animals of each kind have been taken by hunters in each area is obtained by compulsory reporting. All limited entry hunters, and any others who shoot caribou, grizzly bear, cougar, mountain sheep, or mountain goat, must report details of their hunts at a compulsory reporting centre. To provide estimates of the harvest of species that don't require a compulsory report, a hunter survey questionnaire is sent to a sample of all B.C. hunters, and results are analyzed by computer. In addition to reports and surveys, road checks are sometimes set up during the hunting season to obtain a count of the game animals killed in certain areas having limited road access. Together, these records have provided a useful estimate of the game harvest in B.C. for many years.

A continuing program of research is developing new methods and refining current techniques for assessing wildlife populations.



Regulating the Game Guiding Industry

The game guiding industry in B.C. is closely regulated. It caters largely to non-resident hunters, who by law must hire guides. For many game species only a small quota of the total allowable harvest is allotted to non-resident hunters. A guide-outfitter may guide only for the species stipulated in his licence and he cannot operate outside the area he is licensed for. Most guides ensure that the resource is wisely harvested because their income depends on a continual supply of animals.

Many guided hunters seek trophy animals. In parts of interior and northern B.C. where revenue from non-resident hunters is a vital part of the local economy, management aimed at producing trophy animals is important. Since trophy animals usually are old animals, trophy hunting removes a very small part of the total population, generally well under 5%. Stories about wastage of meat by trophy hunters have little foundation in fact. Hunting regulations require that they bring out a least a portion of most game. Moreover, sportsmen from the U.S. and Europe pay a lot for their hunts, and many value the meat highly as a prized delicacy they can serve their friends. Since they are guided hunters, they usually have horses and all the equipment needed to pack out their game.

Regulating Trapping

The harvest of fur-bearing animals is subject to regulation. Restrictions include season length, closed areas, closures on protected species, and control of the kinds of traps used to ensure that trapping is as humane as possible. Trapping regulations are reviewed each year. Registered trappers, like guides, have exclusive territories, and this instills a sense of management responsibility. The number and kind of pelts taken each year must be reported. Many trapline areas in B.C. are large, but because of mountainous terrain and severe winter conditions, access to parts of them is difficult, and large areas are not trapped at all. These natural and imposed restrictions, plus the high reproductive capacity of most small furbearers, make it unlikely that any population of fur-bearing animals will be endangered by trapping activity.

Regulating Sustenance Hunting

Sustenance hunting is the legal harvest of game animals for food outside normal hunting seasons. Sustenance hunters, on a provincial basis, are allowed less than 5% of the available harvest of selected populations of moose, deer and elk. Permits must be obtained from local Conservation Officers. Permit applicants must demonstrate genuine need, i.e., little or no income to buy meat. Sustenance hunters usually are directed to locations where surplus animals are known to occur.

Protection Applies to Everyone

There are some wildlife protection restrictions that apply to everyone. For example, it is illegal to damage or destroy beaver or muskrat houses or the nests and eggs of birds; to capture wildlife or keep wildlife in captivity without a permit; or to let dogs run at large and chase wildlife. In migratory bird sanctuaries it is illegal, among other things, to disturb migratory birds or to use a boat, aircraft or other vehicle. Some regulations designed primarily to protect people may also save wildlife. In National Parks hiking trails may be closed if a grizzly with cubs occurs in the vicinity, thus preventing conflicts which could result in destruction of the bears. In areas where animals are frequently killed by traffic, fences may be constructed to keep animals off a highway, or speed limits may be imposed. Other laws control the dumping of substances, such as oil, which are harmful to birds. These are but a few examples of the measures taken to protect B.C. wildlife.

Protective measures for wildlife are effective only if most people respect wildlife and the law.

Threatened and Endangered Species

Threatened and endangered species are protected under the Wildlife Act and its regulations. Four species that exist in very low numbers in the province — the Vancouver Island marmot, sea otter, white pelican and burrowing owl — are officially designated as endangered in B.C. and may not be killed for any reason. Those species fairly common outside B.C. but whose range barely extends into this province (peripheral species) — the badger, mountain cottontail, and white-tailed jackrabbit — are protected by regulation. Other animals that are naturally rare, such as the subspecies of wolverine found on Vancouver Island, are protected by complete closure of their hunting and trapping seasons.

B.C. has four endangered wildlife species: the white pelican, sea otter, burrowing owl, and Vancouver Island marmot.

Population Management

Protection is the most obvious management strategy for maintaining small populations that otherwise might be further diminished. Managers can also change the size and nature of wildlife populations through introductions, selective harvest, and predator control. All these measures work directly on the population by increasing or decreasing the number and kinds of animals present.

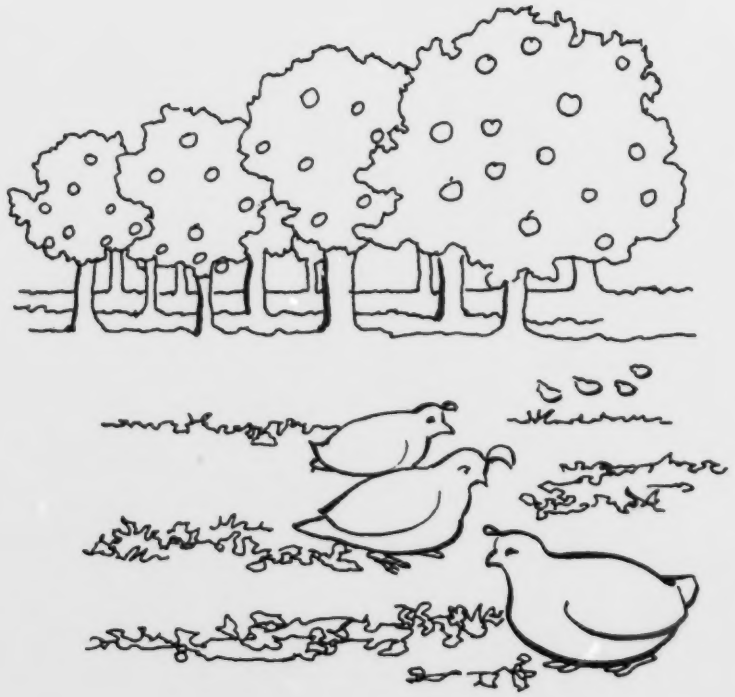
Introductions are intended to increase the abundance or diversity of species in an area. The species being introduced may be an "exotic", that is, an animal that had not occurred in the area before. Alternatively, a native species which has become exterminated or rare may be reintroduced; or animals may be transferred from one part of their natural range to another. Introductions are tricky; the new animals may not survive, particularly if they are exotics, or they may do very well and replace other desirable species. Careful consideration of the situation is required to use this method effectively.

Selective harvest means choosing animals in a population that can be removed without harming the population as a whole, or should be removed to balance sex and age ratios. The current condition of the population and its habitat help managers determine which animals (eg. older males, or young females) should be protected. When selective harvesting is being used as a management method, hunters can only shoot specified age or sex classes.

Most management is aimed at enhancing valuable wildlife species. However, the negative as well as the positive aspects of wildlife must be recognized and attended to if the resource is to be properly managed for all citizens of B.C. For example, predatory animals kill several hundred domestic animals in B.C. each year, and in certain circumstances may also prevent game populations from thriving. In these cases predator control may be used. Predator control programs are based on careful study of local situations and are put in place only where the benefits exceed the costs of control programs. Problem animals which are causing damage or are dangerous may have to be moved or eliminated. Dealing with these kinds of problems is an integral part of wildlife management.

Introduction of Exotic Species

Many exotic species have been introduced to B.C., but only a few have become established. These are mostly birds that found certain habitats in British Columbia well suited to them. Examples are the chukar partridge on the arid sagebrush slopes of the dry interior, pheasants in various farmed areas of southern B.C., and quail on southern Vancouver Island and in the Okanagan Valley. Usually, unless man has created a new kind of habitat, exotic species are not successful. If they are successful, they often compete with native animals for food, and may introduce new diseases or parasites. For these reasons the introduction of exotic species is not expected to have a significant part in B.C.'s wildlife management program in future.



Wildlife Transplants

Transplants have been used to fill vacant habitat with native species or to replenish formerly occupied ranges.

Transplants refer to the movement of animals within their natural range. In some cases a suitable place within the range of the species never was colonized, possibly due to physical barriers such as water or mountains. For example, islands often do not have all the species found on the adjacent mainland. However, this does not necessarily mean that bringing the animals in will have desirable results. Several species transferred to islands, mostly in early years before the establishment of a Wildlife Branch and without proper ecological study, have had harmful effects. Black-tailed deer, introduced to the Queen Charlotte Islands in the early part of this century as a meat source for fishermen and settlers, probably caused the extinction of the small remnant herd of caribou by eating the caribou's food. They presently cause much damage to seedling trees. Transplants to islands have to be evaluated very closely, and probably will play a minor role in future wildlife management activity.

Other transplants have been more beneficial. These include the movement of Roosevelt elk to new areas on Vancouver Island, and establishment of Rocky Mountain elk herds at Lytton, Adams River, Princeton, Christina Lake, Kettle River, and Naramata. California bighorn sheep from the Chilcotin region have been established at Dog Creek and Kamloops Lake, and Rocky Mountain bighorns at Chase and Spences Bridge.

The bighorn sheep transplants constitute a real success story in wildlife management. California bighorns from B.C. have been used to establish several herds in the United States where they had become extirpated. Up to 2500 California bighorn sheep from B.C. stock now exist in 6 states. Other successes include mountain goat transplants, and the development of techniques for moving caribou.

A special case of wildlife transfer is the reestablishment of animals that have become rare or have disappeared from an area. In B.C. reintroductions have involved the sea otter, burrowing owl, and sage hen, using stock from the United States. Sea otters were extinct in B.C., but their extensive marine habitat was still intact along the entire B.C. coast. A total of 89 sea otters from Alaska, released on the west coast of Vancouver Island between 1969 and 1972, have become established, increased in numbers, and spread to new areas. Reintroduction of the sage hen to its former limited range in the south Okanagan has been attempted without success, but ongoing attempts to re-establish the burrowing owl in the same area are looking hopeful.

Carefully conceived transplants of native species which are unlikely to colonize new areas on their own will continue to be an important aspect of wildlife management in B.C.

Wildlife officials must study potential introductions and transplants of animals very carefully.

Predator Control

Removal of livestock predators has long been accepted practice in B.C. Only offending animals in ranching and farming areas are killed. There is no widespread reduction of predator populations. This site-specific control of problem predators is closely supervised by experienced Problem Wildlife Officers of the Ministry of Environment and Parks.

Wolves have become very abundant in northern B.C., where they take caribou, moose, elk and Stone's sheep. They are increasing in the Cariboo area, probably to the detriment of moose and caribou populations, and are also abundant on Vancouver Island, where the main prey is the black-tailed deer. In localized areas wolves have reduced game herds to very low levels, and appear to be preventing their recovery. This situation may be acceptable in parks and reserves where nature is allowed to take its course, or in other areas where game animals are in little demand. However, in places where sport hunting, big game guiding, or viewing of game herds by visitors are important to the local economy, excessive wolf predation may be undesirable. An elk or sheep harvested by guided hunters in northern B.C. contributes up to $10,000 to the northern economy in guide-outfitter fees. A moose bagged by a resident hunter may yield meat worth $500 or more, and a large measure of healthful recreation. In these situations we may wish to claim the game animals for people rather than leave them to the wolves.

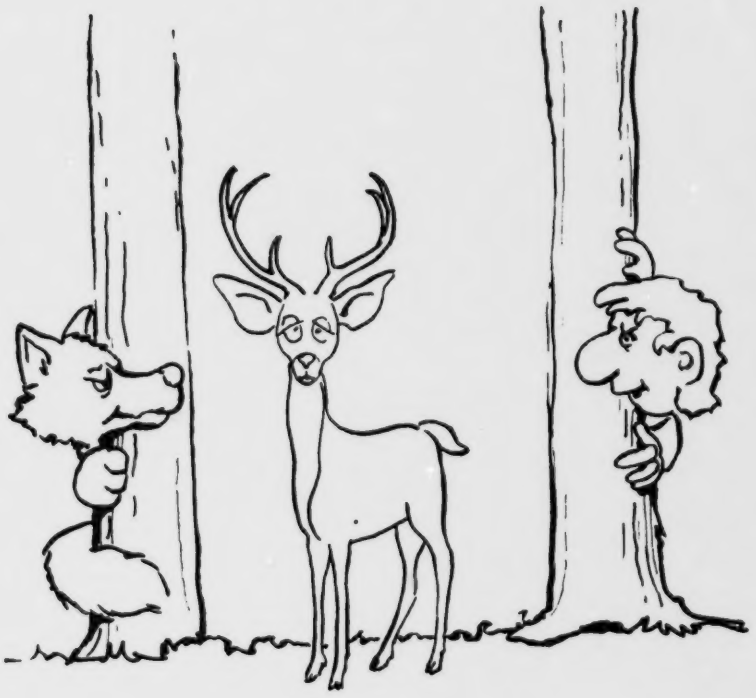
In many parts of the province habitats can be enhanced to increase the population of big game, but enhancement makes little sense if the majority of additional animals produced are eaten by wolves. Likewise, it is difficult to convince a logging company on Vancouver Island to leave valuable old-growth forest for deer winter range if only the wolves will benefit.

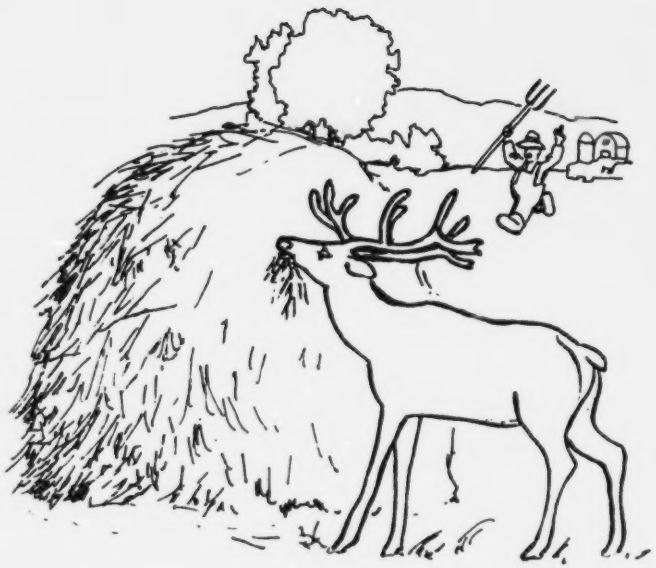
Wolf control is carried on in localized areas of B.C. where prey animals are important to people. The individual wolves are killed humanely. There is no attempt to exterminate wolves as species, nor is there any danger of extermination occurring inadvertently. Wolves reproduce quickly and are widespread in B.C.

As long as there are prey animals present to support them, there will be wolves.

Other predators such as cougars, coyotes, or lynx are currently not controlled anywhere in the province in order to save game birds or big game animals. However, cougar and coyote are thought to be depressing the Junction and Churn Creek sheep herds, both sources of the California bighorn transplants. Control may become necessary there.

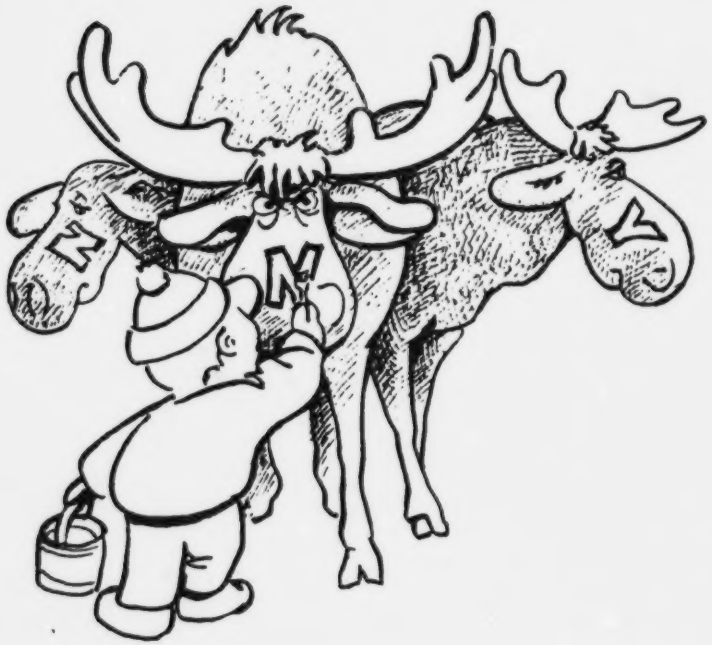
People compete with wolves, and wolves with people.





Problem Wildlife

Wildlife managers in B.C. are becoming increasingly involved in control or prevention of damage caused by wildlife. Prevention of deer damage to orchards is a major concern, particularly in the Okanagan Valley. There personnel from the Ministry of Agriculture and Fisheries and the Ministry of Environment and Parks are testing various repellents and electric fences to keep deer out of orchards. They are also attempting to improve the nearby habitat to attract animals away from tasty apple trees. Similarly elk and deer may damage alfalfa growing in the field or gathered in haystacks. Wildlife damage to forest seedlings also is receiving increasing attention as foresters try to produce more trees on less land in shorter periods of time. There have as yet been few attempts to control the damage that occurs to forest seedlings, usually at low levels, but over vast areas. Wildlife personnel are also frequently called on to remedy problems like farmland or roadway flooding caused by beaver damming, or to remove bears or cougars which have wandered into settled areas.

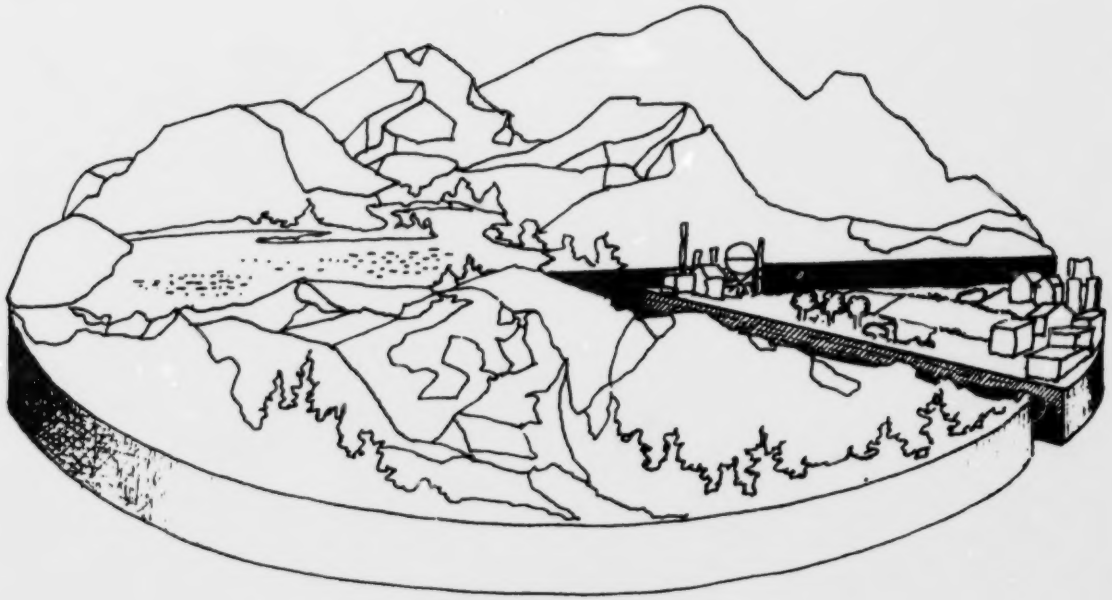


Selective Harvesting

Wildlife managers attempt to improve the production of game species by controlling the age and sex of animals taken by hunters. The aim of experimental management schemes, such as that involving moose in the Omineca Region, is to restore and maintain the most productive balance between breeding-age bulls and cows. This was not possible with traditional hunting attitudes that led hunters to prefer prime bull moose. The new strategy involves harvest of some calves, many of which die in their first year, and some young bulls. Both these groups are less important as breeding stock than the older bulls and adult cows.

Managers hope that selective harvest schemes will eventually allow both the population size and the hunter harvest to increase.

Selective harvesting requires hunters to be more discriminating about what they shoot; in return promising more abundant game for the future.



CROWN

Habitat Management

Wildlife in British Columbia is a common property resource; it belongs to all of the people. Over 90% of the land in British Columbia is Crown land and also a common property resource. Since wildlife depends on habitat, most of the wildlife management in B.C. takes place on Crown land.

There are advantages and disadvantages to public ownership. Clearly since the resource belongs to the people they have a say in how it is to be taken care of. In practice, however, much of the Crown land is controlled by other interests, such as forestry. This does not mean that wildlife needs won't be taken care of, it simply means that the various land users must coordinate their patterns of use so that wildlife habitats are maintained. Consequently communication and cooperation between wildlife managers, various agencies and the public is essential.

Wildlife belongs to all the people in B.C. and all of us have some responsibility for its good management.

Habitat Improvement

Many habitat improvement techniques can be used on lands designated for wildlife, and can be applied cooperatively on multiple use lands where wildlife shares habitat with other land users.

Lands designated for wildlife, that is, those where wildlife production has higher priority than any other use, are often the subject of intensive programs to restore or improve habitat. Techniques used include burning, fertilizing, planting, seeding, and mechanical treatment of ranges. In some situations logging or cattle grazing may be prescribed. Wetlands may be developed through controlling water levels, ditching, dyking and island formation. Often habitat improvement will relate to the special needs of a wildlife species. The production of more food may be called for, or the provision of nesting sites. For example, for the burrowing owl, which is virtually extinct in B.C., wildlife workers built artificial wooden burrows near Vaseaux Lake, 20 km south of Penticton. Families of burrowing owls were brought in from Moses Lake, Washington, and placed in these burrows. A number of owlets survived to flying age, and some are expected to nest in the area as adults.

Wildlife managers in B.C. are concerned about improving habitats for all species: big game, waterfowl and other birds, or endangered species. All wildlife "users", whether hunters, keen naturalists or casual observers, benefit. Improvement of wildlife production on high priority habitats likely will become increasingly important, to compensate for the degradation or loss of other habitats as a result of forest harvesting, hydro-electric flooding, and other impacts.

Waterfowl Habitat Development

Good examples of waterfowl habitat development in B.C. include Bummers Marsh north of Cranbrook, the Creston Valley waterfowl management area, Pitt Polder near Vancouver, and Chilanko Marsh in the Chilcotin. There are many others.

Frequently several agencies participate. For example the Chilanko Marsh, purchased from ranchers by the B.C. Nature Trust, is being improved by Ducks Unlimited in cooperation with the Wildlife Branch. The project has involved building several dykes and dams that divide the 200 hectare waterway into four compartments in which water levels can be controlled to produce just the right nesting conditions and food plants for waterfowl. A peninsula has been turned into an island to provide a safe nesting area for ducks and geese that nest on dry land. With money from sources like the Habitat Conservation Fund, Wildlife Habitat Canada and the B.C. Nature Trust, and construction of works by Ducks Unlimited, more projects like this can be expected in the future. The results for B.C.'s waterfowl resource will be exciting.

Prescribed Burning

"Prescribed" or deliberate and controlled burning has been used to clear areas where trees are encroaching on grassland ranges, to rejuvenate grasslands themselves, or to initiate nutritious new willow and aspen growth in moose habitats. Burning removes old overgrown shrubs and unwanted trees, and releases nutrients which act as fertilizer for new growth.

The first successful prescribed burns were carried out in Wells Gray Park in the 1960's and early 1970's. More recently at the Grove Burn, 24 km east of Prince George, 1,700 hectares of land covered by a forest fire in 1961 has been enhanced, primarily to increase moose and allow people to see them. Several parts have been re-burned to improve forage production for the moose and for other animals; and an observation tower has been constructed near Highway 16, with brush cleared in lines radiating away from the tower so that people can observe moose going about their business in the burn. In the Ashnola area near Keremeos, several hundred hectares of California bighorn sheep winter-spring range have been improved by burning. This project involved hand clearing 2.5 km of firebreak, then lighting fires from the air with a helicopter-carried drip torch. Many other prescribed burns have been carried out in other parts of the province.

Browse production can also be induced by mechanically breaking down old shrubs. In the Cariboo district, for example, members of a local fish and game club, aided by grants from the Public Conservation Assistance Fund, have mechanically treated old willow stands to stimulate fresh new growth and provide browse for wintering moose.

Cooperation with Forestry

Since over 50% of B.C. is forested, forest management practices, including cutting and reforestation, have a significant impact on wildlife habitat. In years past, logging went on without much consideration for its effects on wildlife. Changes to the Forest Act, however, now ensure that impacts of forestry on other concerns, such as outdoor recreation, protection of watersheds, and wildlife production, are taken into account. Logging plans are reviewed by wildlife managers under a referral process, and recommendations are made to minimize adverse impacts on wildlife. Recommendations may include delayed cutting, alteration of cut block size, shape, or sequence, modification of logging methods or access routes, alteration of reforestation procedures or site treatments such as thinning, and the use of burning to improve habitat.

As the forest industry moves into more intensive timber production, many unanswered questions concerning wildlife require research. On Vancouver Island a cooperative project with the Ministry of Forests and Lands is exploring how to integrate production of black-tailed deer and Roosevelt elk with tree production. On the mainland coast another cooperative research program is examining the effects of forestry practices on grizzly bears. A program is also underway to develop a series of wildlife habitat handbooks, computer programs, and other tools which will bring together existing knowledge of wildlife habitat requirements. With the use of these new tools, wildlife managers and foresters will be able to predict the implications of forest development plans for wildlife more readily and accurately.

Coordinated Resource Management

Cattle grazing ranges, which are also under the administration of the Ministry of Forest and Lands, have been the subject of cooperative agreements between foresters, ranchers, and wildlife managers. Extensive discussion between these groups has resulted in the development of Coordinated Resource Management Plans. Wildlife managers have been heavily involved in scores of these agreements, recommending cattle grazing rates and practices, fencing, water development, and other measures to improve the ranges for wildlife. Many other land use activities, such as the clearing of powerline right-of-ways, are also referred to wildlife managers for their comment. Cooperative habitat management is a never-ending process because resource management plans must be kept abreast of development.

Dealing with other resource agencies sometimes seems time consuming — even frustrating — to everyone involved. However, wildlife managers recognize that the future of wildlife over much of the province depends upon other land users and resource developers understanding wildlife's needs and taking those needs into account in their own plans and actions.

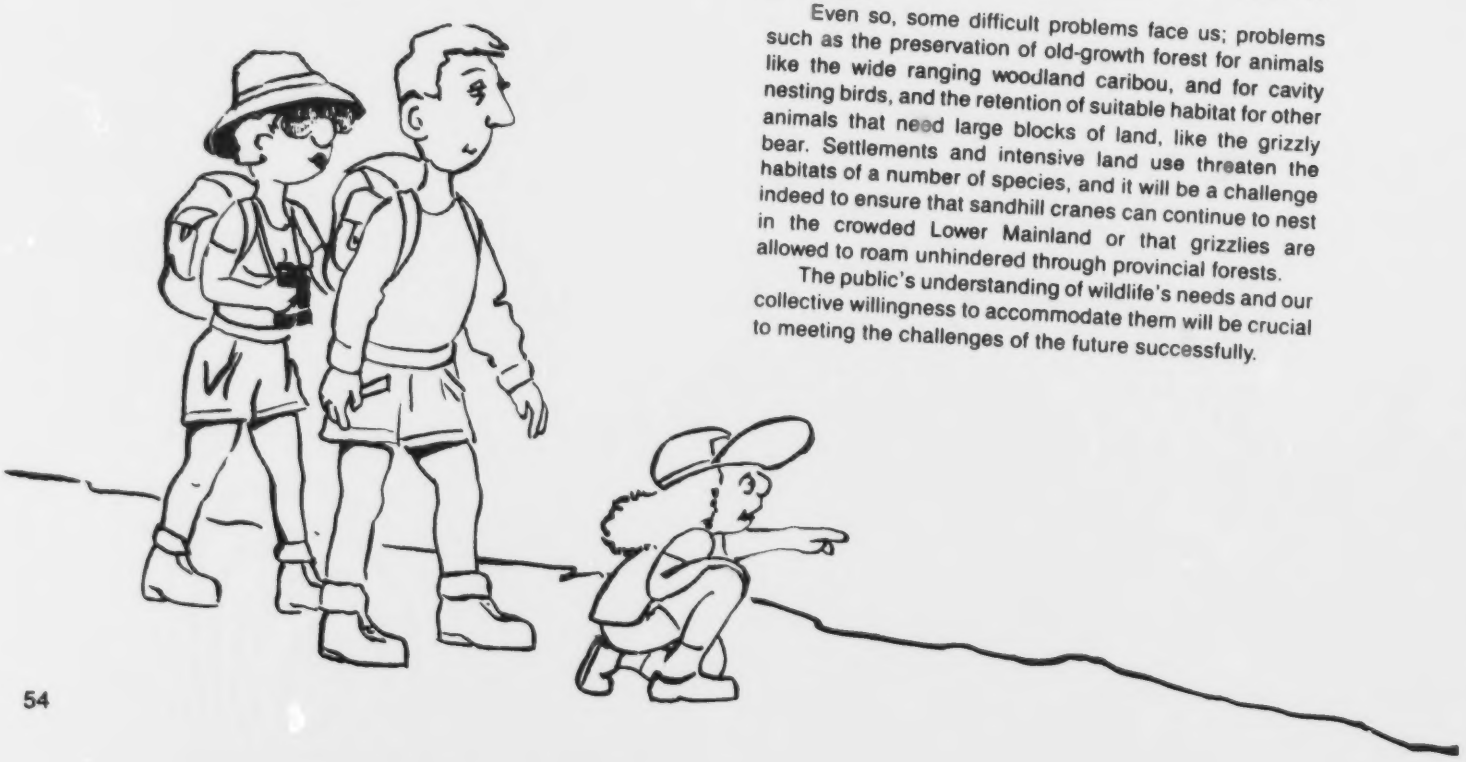
Cooperative habitat management is the key to long term wildlife abundance in B.C.

The Challenge Ahead

The challenge of the future for wildlife management in B.C. is to conserve the generous diversity and abundance of wildlife that has been bestowed on us, and to use it in such a way that all people benefit. Given the protection that our wildlife receives, cooperative management programs involving other land users, a variety of critical areas set aside for wildlife, and habitat improvement programs on high priority wildlife lands, that objective should be attainable.

Even so, some difficult problems face us; problems such as the preservation of old-growth forest for animals like the wide ranging woodland caribou, and for cavity nesting birds, and the retention of suitable habitat for other animals that need large blocks of land, like the grizzly bear. Settlements and intensive land use threaten the habitats of a number of species, and it will be a challenge indeed to ensure that sandhill cranes can continue to nest in the crowded Lower Mainland or that grizzlies are allowed to roam unhindered through provincial forests.

The public's understanding of wildlife's needs and our collective willingness to accommodate them will be crucial to meeting the challenges of the future successfully.



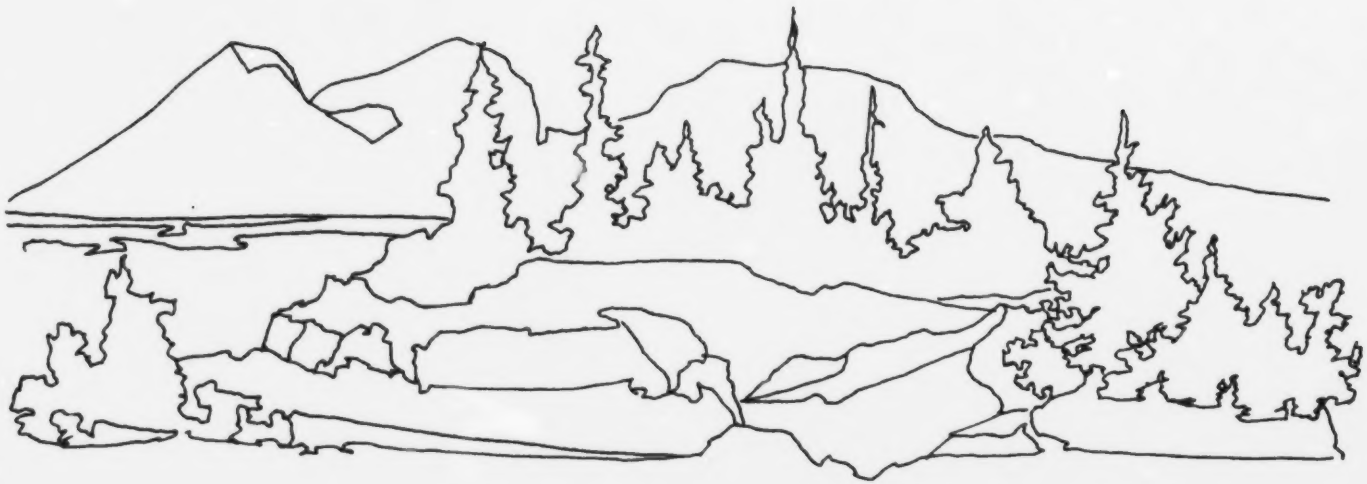
Public Involvement

Many avenues to promote better wildlife management in B.C. are open to you. Members of such organizations as the B.C. Wildlife Federation and the Federation of B.C. Naturalists, groups who have a special interest in wildlife, keep abreast of current wildlife management issues. They often have an opportunity for input to decisions and plans. Members of these organizations sit on regional or local committees which deal with problem wildlife, the management of cooperative wildlife areas, the choice of habitat enhancement projects, and other matters. Through these and other organizations, you can participate personally and directly in wildlife and habitat improvement projects. Financial assistance for these projects is available from the Public Conservation Assistance Fund, and from other sources.

In the past, the public has been invited to comment on the new Wildlife Act, the Proposed Wildlife Management Plan for British Columbia, and specific issues such as game ranching. Undoubtedly further opportunities to contribute your ideas for the betterment of wildlife management and conservation in B.C. will arise in coming years.

The Challenge is Yours

Wildlife holds a very special position in British Columbia. It is publicly owned and publicly used. Because it is ours, each of us has a very special obligation to become informed about its management and to share in its stewardship. Take up the challenge!



Ministry of
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